WHAT IS CLAIMED IS:

1. A method for reducing the carbon monoxide content of a hydrogen rich gas, comprising:

   providing a reactor having a catalyst bed containing an oxidation catalyst;

   distributing an oxygen-containing stream throughout the catalyst bed in the presence of the hydrogen rich gas and the oxidation catalyst bed;

   maintaining the reactor operating temperature in a desired range.

2. The method of claim 1, wherein the reactor has a porous tube substantially positioned within the catalyst bed for distributing the oxygen-containing stream throughout the catalyst bed.

3. The method of claim 2, wherein the oxygen-containing stream is maintained at a higher pressure than the hydrogen rich gas.

4. The method of claim 1, wherein the desired range for the reactor operating temperature minimizes the oxidation of hydrogen.

5. The method of claim 1, wherein the desired range for the reactor operating temperature is from about 90°C to about 180°C.

6. The method of claim 1, wherein the desired range for the reactor operating temperature is from about 90°C to about 150°C.

7. The method of claim 1, wherein the reactor has a cooling jacket for maintaining the reactor operating temperature.

8. The method of claim 7, wherein the cooling jacket contains a circulating coolant selected from the group consisting of water, steam, air, and hydrocarbon fuel.

9. An apparatus for selectively reducing the carbon monoxide content of a hydrogen rich gas, comprising:

a catalyst bed containing an oxidation catalyst;

a porous tube positioned substantially within the catalyst bed for distributing an oxygen-containing stream throughout the catalyst bed; and

a cooling jacket for maintaining the reactor operating temperature in a desired range.

10. The apparatus of claim 9, wherein the porous tube is a sintered stainless steel tube.

11. The apparatus of claim 9, wherein the porous tube is an alumina tube.

12. The apparatus of claim 9, wherein the porous tube is substantially positioned along the catalyst bed length.

13. The apparatus of claim 9, wherein the desired range for the reactor operating temperature is from about 90°C to about 180°C.

14. The apparatus of claim 9, wherein the desired range for the reactor operating temperature is from about 90°C to about 150°C.

15. The apparatus of claim 9, wherein the cooling jacket contains a circulating coolant selected from the group consisting of water, steam, air, and hydrocarbon fuel.

16. A reactor module for use in a compact fuel processor for selectively reducing the carbon monoxide content of a hydrogen rich gas, comprising:

a catalyst bed containing an oxidation catalyst;

a porous tube positioned substantially within the catalyst bed along the catalyst bed length for distributing an oxygen-containing stream throughout the catalyst bed; and

a cooling jacket surrounding the catalyst bed for maintaining the reactor operating temperature in a desired range.

17. The reactor of claim 16, wherein the porous tube is a sintered stainless steel tube.

18. The reactor of claim 16, wherein the porous tube is an alumina tube.

19. The reactor of claim 16, wherein the desired range for the reactor operating temperature is from about 90°C to about 180°C.

20. The reactor of claim 16, wherein the desired range for the reactor operating temperature is from about 90°C to about 150°C.

21. The reactor of claim 16, wherein the cooling jacket contains a circulating coolant selected from the group consisting of water, air, and hydrocarbon fuel.